THE ZOOLOGIST.

THIRD SERIES.

Vol. II.] JULY, 1878. [No. 19.

ON THE MOULT OF BILL AND PALPEBRAL APPENDAGES IN THE COMMON PUFFIN.

DISCOVERED BY DR. BUREAU.

By the Editor.

Singular as the above title may appear, it not only appropriately expresses the author's meaning, but is fully substantiated by the facts which he has detailed in a very interesting article recently published in the 'Bulletin de la Société Zoologique de France.'* His discovery is so remarkable, and, as far as I am aware, has been so little suspected by English ornithologists, that I believe it will be as agreeable to the readers of 'The Zoologist' as it is due to the author, to make it known as widely as possible, the more so as I have reason to think that the journal in which the article in question is published has not so extended a circulation amongst naturalists in this country as it deserves.

In the following pages, by Dr. Bureau's permission, I have attempted a translation of the more important portions of his paper, and he has most obligingly enabled me to reproduce the principal plate with which he has illustrated his subject. I trust he will accept this expression of my sincere thanks.

After referring to the published opinions of previous authors relative to the Puffin, and pointing out how little, comparatively, is known concerning the natural history of this bird, Dr. Bureau proceeds as follows:—

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* "De la Mue du Bec et des Ornements Palpébraux du Macareux Arctique, *Fratercula arctica* (Linn.), après la Saison des Amours." Par le Docteur Louis Bureau. Bull. Soc. Zool. de France, 1878.

"My ornithological excursions made me acquainted with two islands in Brittany, one the Ile de la Manche, and the other the Ile de l'Ocean, which are still privileged to give refuge during the nesting season to hundreds of Puffins.

"These two numerous colonies, the outposts of those which people the Northern Seas, furnished me with the materials for my study.

"In the spring the Puffins assemble on these islands to devote themselves to the task of reproduction; they are then all in the same plumage and wear the same adornments (*ornements*). The cheeks are of a greyish white; the beak elevated, and thick on a level with the nostrils; a pleat (*ourlet*) at the base of the upper mandible; the lower mandible curved regularly; the eyelids vermilion, adorned with two horny plates (*plaques*); a large rosette (*rosace*) of a bright yellow at the gape.

"By the middle of July the young are fledged, and towards the end of that month or the beginning of August the Puffins are out at sea. After that date not a single bird is to be seen on these rocks, which up to that time were so full of life.

"The rough weather sets in, the Puffins leave the shore and disperse over the sea, and then supervenes a blank in their history, which is only filled up by rare captures. But soon the winds of winter begin to blow with violence, and after some days of those fearful gales which every year visit our coasts, the waves bring ashore hundreds of dead or dying Puffins. The victims are chiefly young birds, but the adults share the same fate if the storm arises at moulting time, when the simultaneous shedding of the quill-feathers reduces the wings to mere stumps. Three times in the winter of 1873, after storms (January 24th, February 6th and March 4th), M. Marmottan, at Cape Ferret, Arcachon, came across thousands of Puffins, dead, and rolled in the sand by the waves.*

"The Puffins thus cast ashore on the French coast in winter are perfect skeletons, and clad in a plumage different to that worn by the individuals we get in the breeding season. In the orbital region, for instance, they have a spot more or less large, of a dusky brown; they have not the red eyelids, nor the horny plates above and below the eye, nor have they the puckered yellow skin at the base of the bill, and what is still more remarkable, the bill is differently formed; it is neither of the same size, shape, nor colour, and the pieces of which it is composed are not even the same. It is small, sliced off (*tronqué*) in front, especially at the lower mandible, wanting the pleat (*ourlet*) at the base, and flattened laterally on a level with the nostrils, where a solid horny skin of a bright lead-colour is replaced by a soft greyish membrane.

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* The same observation has been made by Willughby, in his 'Ornithology.'

"Hitherto authors have considered the Puffins found in this state to be the young, of different ages, of *Mormon arctica*.* This view was even generally adopted, when M. J. Vian, examining a large number of specimens procured in winter on the coasts of France, and recognizing amongst them both old and young, thought that they should be specifically separated from *Mormon arctica* under the name *Mormon grabæ*.†

"Neither of these views can be admitted. The first falls to the ground before the facts which I am about to detail; as to the second, in order to end all doubt, my friend M. Vian, admitting that, in view of my recent observations, *Mormon grabæ* has no longer any claim to specific distinction, has made a point of assisting me by obligingly placing at my disposal the specimens which served him as types. Dr. Marmottan, too, whose ornithological collection is rich in material for a study of the fauna of France, has entrusted me with his fine series of Puffins. A large number of specimens, from all quarters, have in fact been offered to me. I shall use them later, when, after another season's observations on the coast of Brittany, I shall make known some other interesting points in the history of the Puffin. For the present I shall confine myself to a study of the metamorphoses to which the beak and the palpebral appendages of these birds are subject after the breeding season.

"It will perhaps be interesting to state here the different stages of enquiry through which I arrived at the discovery of the metamorphosis in question. I had for some years remarked that the beak of specimens killed on the French coast belonged to two very characteristic types, one of which was met with in spring and the other in winter.

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* See 'The Zoologist' for 1862, pp. 8003-4 and 1863, p. 8331.

† Bull. de la Soc. Zool. de France, 1876, p. 4. M. de Norguet (Bull. Scient. du Dep. du Nord, 1877, p. 39) sees in *Mormon grabæ* merely individual varieties of *Mormon arctica*.

"The disappearance of the former type of Puffin just as the latter arrived, the presence in each of specimens evidently adult, the exact correspondence in size, speedily suggested that neither of the views above stated could be quite correct. The discovery of two large colonies of these birds on the coast of Brittany shortly strengthened my conclusion.

"I had, in a word, arrived at the conviction that the views in question were erroneous, without seeing my way to a satisfactory solution, when a careful examination of the beak, gape and palpebral appendages led me to suspect that these parts must be subject to a complete metamorphosis after the breeding season. The more I examined the pleat (*ourlet*), the rosette at the base of the bill, the horny plates to the eyelids, the more evident did the metamorphosis appear. But how did this phenomenon come about? Was it effected only when the birds had reached the high seas, or was it for me to witness it in the birds which were the last to quit their breeding places? Of this I remained ignorant until quite lately.

"In June, 1876, during a visit which I made with my brother to these colonies of Puffins, the examination of a large number of living birds strengthened my convictions, and I resolved to return shortly in time to witness the metamorphosis. My choice lay between the Ile de la Manche and the Ile de l'Ocean, and although the former was frequented by a much larger colony, I selected the latter in the hope of obtaining on the same rock the young of the Roseate Tern (*Sterna Dougalli*).

"Although at that time I was occupied in Paris with my physiological studies, I started without hesitation on the 25th August, 1876, and on the 27th I crossed to the outskirt of the island, which rises above the sea in a majestic arch. But rough weather often prevails on this wild sea-board, abounding in shoals. The sea, running high with the tide and north-east wind, broke over the only accessible point, and it was therefore impossible to think of landing; besides it would have been labour lost, for the rock was deserted. In the hope of finding some loiterers I explored in vain the shores of the island; all, old and young, had already taken their departure, and the Roseate Terns were also gone. My journey therefore was fruitless: I had come a fortnight too late.

"In the month of July, 1877, returning from an ornithological trip to the South of Spain, I was not contemplating an excursion to our coasts, when an opportunity occurred of shooting some Puffins at a favourable period. On July 1st one was sent to me in process of metamorphosis. The time was well chosen, and I could not refrain from going to study on the spot this remarkable phenomenon. A compatriot whose name is well known to ornithologists, my excellent friend M. E. Bonjour, was very anxious to accompany me.

"On the 31st August we visited the Ile de la Manche. To our great disappointment the Puffins were already gone. About thirty only, very wary, kept to the edge of the island, and we could only secure a couple in partial change.

"Without losing time, we crossed to the Ile de l'Ocean, round which we loitered for two days (5th and 6th August). The colony was certainly not what it had been during the breeding season, but the birds were still so numerous there that we had soon to cease shooting to avoid unnecessary slaughter.

"Almost all the specimens which fell to our guns were in full metamorphosis. The beak of these birds, which in the spring forms a horny sheath, solid and homogeneous, was then in process of scaling off in pieces like plates of armour; the fine rosette at the gape and the red eyelids were shrivelled and discoloured; the horny plates in the ophthalmic region had in certain specimens fallen off, and in others were coming off; the feet, of a bright vermilion in the breeding season, had become orange; in fine, in some specimens the moult had already commenced (except in the wings and tail), and the birds would soon have been in their winter plumage.

"In a word, the adult *Larventauscher*[*] were, under our very eyes, changing to what some authors consider the young of *Mormon arctica* and others the adult of *Mormon grabæ*.

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[*] Brehm, in his 'Handbuch,' calls the Puffin in one place *Larventauscher*, but elsewhere throughout he invariably spells it, like other authors, *Larventaucher* (without the *s*). If the former spelling be right, one must conclude that the moult of bill in the Puffin is a phenomenon of which the fishermen of the Baltic have long before me been aware. The *Larventauscher* is in fact *der vogel der seine Larve tauscht*, i.e., the bird which changes its mask. As to the other name, *Larventaucher*, it may signify strictly, *der Taucher mit einer Larve versehen*, i.e., the Diver with a mask—a name well suited to the bird; but every German reader will see that the composition is not very happy. It is not impossible, then, that the former is the

"It is now ten years since my friend M. Marmottan recollects having killed, in September, 1867, in the Baie de Somme, a Puffin, from the beak of which several pieces were becoming spontaneously detached.

"The best way of obtaining a comprehensive idea of the changes which the beak and the palpebral appendages of the Puffin undergo after the breeding season is undoubtedly to cast a glance at the movable pieces figured on the accompanying Plate; but the phenomenon is complex, and thoroughly to understand its different phases one must first comprehend the constitution of these parts in the adult in spring and in winter.

"The adult *Fratercula arctica* in spring has the beak elevated at the base, the lower mandible regularly curved from the base to the extremity. The beak is divided into two very distinct parts; one, the posterior, undergoes the phenomenon of moulting; the other, the anterior, remains unaffected:—

"1. The posterior portion is formed by the combination and suture of nine horny pieces, which disunite and fall apart after the breeding season. These are: on the upper mandible (fig. 1), the horny pleat (*l'ourlét corné*), *a*; the nasal covering (*la cuirasse nasale*), *b*; the two subnasal flakes (*lamelles*), *c*; and the two transparent flakes, *e*, which cover the posterior part of the first ridge (*bourrelet*). On the lower mandible, the two horny bands (*liserés cornés*), *f*, and the chin-sheath (*cuirasse mentonnière*), *g*.

"2. The anterior, or persistent portion, presents three ridges and three furrows, which I may designate (going from base to point) as the 1st or great ridge (I.), the 2nd or middle ridge (II.), the third or little ridge (III.); the 1st or great furrow (1), the 2nd or middle furrow (2), and the 3rd or little furrow (3). Lastly, the beak is terminated by a smooth piece, forming a triangle with a curvilinear base, which I call the point of the beak (*h*). At the

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true popular name. Ornithologists, not understanding the allusion to the change of mask, would see only in the final *Tauscher* the German name for "Diver," *der Taucher*, ill pronounced. But I will venture no further on the dangerous ground of etymology, which is not my province, and I hasten to conclude with this simple reflection, which I submit to German naturalists:—If the *Larventauscher*, *le Changeur de Masque*, is the true name of *Fratercula*, it is only right that it should be restored; if not, it may well be bestowed on it, for it is impossible to express more accurately in one word the remarkable physiological phenomenon which characterizes this bird.

gape, a thick skin, puckered and folded, forms a large rosette of an orange-yellow. The appendages of the eyelids consist of a wide, thick border of vermilion, and two horny flakes of iron-grey, one above triangular, the other beneath elongated (horizontally).

"Let us now see the aspect presented by the adult Puffin in winter, or after the breeding season.

"The beak is smaller, as if sliced off (*tronqué*) in front, and especially at the lower mandible, which then forms a broken line instead of a regular curve (fig. 2). The two very distinct parts which I have pointed out as existing in the adult in spring, may be here recognized, the one posterior, strangely modified by the fall of the nine horny pieces above-mentioned; the other anterior, which has remained unaffected.

"1. The posterior part has lost somewhat of its thickness and consistency; it is re-covered with a thick skin which presents, on the upper mandible (fig. 2), a membranous pleat (*a′*) and the nasal membrane (*b′*); on the lower mandible, the membranous band (*f′*) and the sheathless chin (*g′*).

"2. The anterior part has undergone no modification; it remains as it was in the breeding season.

"The rosette at the gape is reduced to a narrow band of pale yellow. The free edge of the eyelid has lost colour, and the horny flakes are wanting."

Dr. Bureau here furnishes a *tableau* in which these two conditions of *Fratercula arctica* in spring and winter, as well as the slight modifications which the plumage undergoes at those seasons, are set forth in parallel columns. He then proceeds, under the head of "Transformation du Bec," to point out the mode in which the various pieces of the beak are respectively shed or cast.

The adult bird, he observes, owes its summer dress to phenomena of three kinds—hypertrophy, formation of horn, and coloration; and loses it under the influence of three inverse phenomena, namely, atrophy, loss of horny substance, and loss of colour.

He concludes by showing that analogous phenomena occur in the allied species *Fratercula glacialis*, *F. corniculata* and *Lunda cirrata*.

Explanation of Plate.

FIG. 1. *Fratercula arctica*, adult male, in spring, or during the breeding season (natural size). Coast of Brittany, 6th June, 1876. (Coll. Dr. Bureau.)
FIG. 2. *Fratercula arctica*, adult male, in winter or after the breeding season (natural size). Cape Ferret, near Arcachon, Gironde, 4th March, 1873. (Coll. Dr. Marmottan.)
FIG. 3. *Fratercula arctica*, undergoing the moult (enlarged to twice the natural size).
FIG. 4. *Fratercula arctica.* Adult assuming the nuptial appendages.
FIG. 5. Horny pieces which fall off after the breeding season.

BIRD MIGRATION IN THE SPRING OF 1878.

By John Cordeaux.

THE following notes, although perhaps not containing anything of special importance, will be interesting to British ornithologists, showing as they do the almost continual stream of migrants which passed Heligoland for many weeks in succession during the spring of the year. They were sent to me from time to time by that indefatigable observer, Mr. Gätke, and are taken from his own notes and observations.

The autumn migration of birds southwards in 1877 was greatly prolonged beyond the usual period; and from Mr. Gätke's notes it appears that, even as late as the commencement of February, all the birds had not left the North of Europe, many laggards remaining after the usual period of migration. This abnormal state of affairs was probably induced by the extremely mild winter of 1877-78 in Scandinavia. Food continuing accessible, and the weather being not too severe, some of the more hardy species seem to have delayed their journey southward until the early part of 1878, when the sudden outburst of severe weather towards the end of January sent the loiterers southward with a rush. It will be seen that scarcely had the down-stream ceased, before the return flood set in, and continued, with but slight intermissions of unfavourable wind and weather, for the rest of the season. February was a most unusually mild month, many days being equal in temperature to what we expect at the end of May. This spring-like weather had the effect of inducing an earlier migration of the more hardy species. The same phenomena were observable, although to a less extent, on our own shores, and I noticed that the immense flocks of Golden and Green Plover frequenting our Lincolnshire marshes broke up and took their departure some time in advance of the average period.

Mr. Gätke's notes commence with the end of January, and are continued as follows:—

"January, night, from 27th to 28th. *Turdus pilaris*, countless flights.

"29th, from 9 A.M. and earlier to 4 P.M. *Colymbus septentrionalis;* an uninterrupted stream of birds from N.N.E. to S.S.W. passing to the east of this island; constantly from eight to twelve in the field of the glass.

"February 2nd, wind E. in the morning, N. and N. by E. in the evening. *Turdus merula*, from twenty to forty, as I fancy from the north.

"7th. Commencement of spring migration. Birds moving northward again; wind westerly. *Motacilla sulphurea*, first migration; *Sturnus vulgaris*, flights twenty to sixty; *Corvus*, coming, ten to twenty. Night, 7th to 8th. *Alauda arvensis*, a great many.

"8th. *Alauda arvensis*, off island, passing fishing-boats all day E. by N.

"9th, wind N.W. and N., fog; midday somewhat clear. *Alauda arvensis* seen passing overhead in great numbers, E. by N.; *Turdus merula*, some; *Sturnus vulgaris*, some.

"10th, wind W. and mild. *Alauda arvensis*, during night and day; *Columba palumbus*, one; *Turdus musicus*, a few.

"13th, wind S. *Columba palumbus*, ten to twelve.

"14th to 15th, S.W., night. *Charadrius auratus* and *Tringa alpina*.

"15th, W.S.W. *Alauda arvensis*, great numbers at sea, N.E.; *Anthus pratensis*.

"16th to 17th, W., foggy. *Alauda arvensis*, a great many.

"February 18th, W. *Alauda arvensis*, a great many; *Turdus merula*, ten to twenty; *Corvus frugilegus*, about one hundred; *Fringilla cannabina*, pretty numerous; *Saxicola rubicola*, two; *Charadrius vanellus* and *auratus*, many; *C. hiaticula*, one.

"19th, westerly, clear. *Turdus merula*, fifty to sixty at least; *T. viscivorus*, twenty to twenty-five; *Saxicola rubicola*, four to six; *Charadrius vanellus*, some.

"20th to 21st, W., cloudy. *Turdus merula*, pretty numerous; *Charadrius auratus*, *T. alpina*, *Turdus*, *Alauda*, at lighthouse.

"22nd, W., cold. Nothing.

"23rd, W., cloudy, cold. *Sturnus vulgaris*, flights from twenty to sixty; *A. arvensis*, many; *arborea*, some; *Charadrius vanellus*, some.

"26th, N.W., cold. *Turdus merula* and *viscivorus*, some.

"27th to 28th, night, westerly, at lighthouse. *Alauda arvensis*, *T. merula*, *Tringa*, *C. auratus*, *Vanellus*, *Hæmatopus ostralegus*, *Regulus ignicapillus*, some; during day time nothing.

"28th to March 1st, westerly, at lighthouse. *Sturnus vulgaris*, thousands; *Alauda*, *Turdus*, *Tringa*; *C. hiaticula*, beginning.

"March 1st, W., alternately fog. *Motacilla lugubris*, one or two.

"2nd to 3rd, fog. Nothing.

"4th, W., clear. *Accentor modularis*, several, the first of the season; *Saxicola rubicola*, six to ten; *Turdus merula*, fifty to one hundred.

"10th. Last week birds were next to none, which has been occasioned by prevailing fogs. On the 8th a storm (N. by W.) about 9 A.M., approaching N.W., very heavy. On the 4th six to ten *Saxicola rubicola* and the first *Accentor modularis* of the year; on the 5th ten to fifteen *S. rubicola*. Starlings, Lapwings and Larks, as also Golden Plover have passed over in immense numbers during all the nights. Blackbirds are not on a regular move, because the sexes are promiscuously mixed; these birds have been turned by the unseasonable weather.

"31st. Nothing but N.N.W., N. and N.E. winds; cutting cold, sleet and hail in abundance, and of course no birds. Whilst all the rest are wanting, there are more this spring of Stonechats than I recollect having seen for years. The Gold-crested Wren comes every spring (March) in sufficient numbers to rank it with the common customers, although not by tens of hundreds, or even tens of thousands, as sometimes in autumn (October and November).

"In April, Rooks, Jackdaws and Hooded Crows, from the 9th to the 15th daily, in large numbers. *Saxicola rubicola* last seen on the 3rd. *P. rufus* and *M. flava*, some daily since the 13th. *Hirundo rustica*, first on the 19th, only two or three since. *Sterna cantiaca*, daily, lots of them. *Charadrius morinellus*, three on the 17th. Of the *Curruca* family, not one as yet turned up. Wrynecks and Hoopoes, a few. *Fringilla cœlebs*, *cannabina* and *chloris*, lots for ever so long; *montifringilla*, less than usual. Taken altogether it is undoubtedly bad; if weather does not turn warm, with a S.E. and S.S.E. wind, there will be nothing."

On the north-east coast of Lincolnshire I have seen fewer migrants than has been the case for many previous years. Having had but slight intervals of cold N. and N.E. winds, and but few days of really bad weather to retard them, the birds have gone forward at once, without tarrying in our marshes; consequently there has been no accumulation in the coast district as is generally the case. This has been particularly apparent with the Fieldfares, which not unfrequently hang about in great flocks for weeks before taking their departure. This year I have scarcely seen any.

I extract from my note-book the dates of arrival of our summer migrants in this district:—

On the 7th February Mr. Bailey, of Flamborough, writes, "I have just spoken to one of our fishermen, who has come in from sea, who informs me the sea was alive with Guillemots this morning."

February 16th. Larks singing at 6.30 A. M. Lovely spring-like weather.

23rd, W.S.W., warm, close, and overcast. Large flights of migratory Starlings on the coast.

28th. *Anthus pratensis*, have returned to their nesting haunts.

March 1st. *Charadrius pluvialis* and *Vanellus cristatus*, have broken up their flocks and left the district; the latter in small bands of from twenty to thirty.

2nd, wind W.S.W. *Turdus pilaris*, many; *Emberiza miliaria*, flocks twenty to thirty.

10th, W., very fine and warm. *Motacilla Yarrelli*, many; *Saxicola rubicola*, one.

April 2nd. Hooded Crows have departed; only four laggards seen after this date.

9th, strong E. wind, and bitterly cold. *Hirundo rustica*, one.

April 15th, S., mild and warm. *Phylloscopus trochilus* heard; *Hirundo rustica*, several.

17th, S., warm. *Motacilla Rayi* and *Sylvia cinerea.*

18th. *Hirundo riparia.*

20th, S., warm. *Saxicola œnanthe*, one, a male.

26th, N.E., cold. *Cuculus canorus.*

30th. *Saxicola rubetra.*

May 1st. *Salicaria phragmitis; Hirundo urbica*, two.

3rd. *Anthus arborea.*

9th. *Sylvia hortensis.*

14th. *Muscicapa grisola.*

16th. Grey Plover, Whimbrel and Dunlin on Humber flats; the former very numerous and in full breeding or summer plumage. No waders or shore birds seen after this date.

18th. *Cypselus apus*, many.

I have neither seen nor heard of any Dotterel (*Endromias morinellus*) this season.

THE MAMMALS OF SHAKSPEARE.

By Henry Reeks, F.L.S., F.Z.S.

(Continued from p. 205.)

The Fox, *Vulpes vulgaris.*

That most enjoyable of all sports, fox-hunting, in the proper acceptation of the term, appears to have been unknown in Shakspeare's time. Poor Reynard's name is generally applied as an epithet, denoting a low, cunning, selfish and disreputable person. "Vulpecides," in those days, were evidently looked upon as benefactors to mankind in general, and to the British farmer and poultry keeper in particular. The time-honoured fable of the "Fox and the Grapes" crops up in *All's Well that Ends Well*, Act ii., Scene 1.

The fox is mentioned upwards of thirty times, but a couple of quotations illustrating his fondness for lamb (and he is no bad judge either!) will be sufficient.

> "The *fox* barks not when he would steal the lamb."
> *King Henry VI.*, Part II. Act iii., Scene 1.

> "Alas, poor Proteus! thou hast entertain'd
> A *fox* to be the shepherd of thy lambs."
> *Two Gentlemen of Verona.* Act iv., Scene 4.

Amongst the *Mustelidæ*, Shakspeare alludes to the sable, fitchew (polecat), ferret, weasel, otter, and badger or "brock."

THE SABLE, *Martes zibellina.*

Hamlet, speaking ironically, though bitterly, of the short time that had elapsed since the death of his father, says—

> "So long? Nay, then, let the devil wear black, for I'll have a suit of *sables*."
> *Hamlet.* Act iii., Scene 2.

THE POLECAT, *Putorius fœtidus.*

Shakspeare mentions the "fitchew" or polecat sometimes as an epithet, but never to denote anything very nice or enviable. In *Troilus and Cressida*, Act v., Scene 1, Thersites, to show his detestation of Menelaus, exclaims:—

> "To be a dog, a mule, a cat, a *fitchew*, a toad, a lizard, an owl, a puttock, or a herring without a roe, I would not care: but to be Menelaus—I would conspire against destiny."

THE FERRET, *Putorius furo.*

The word "ferret" we find applied as a verb adjective, and adjective; it is probable that ferrets were introduced into the country before the poet's day; in fact, the second quotation given below tends to prove that the animal was well known to him:—

> "BOY. He says his name is Master Fer.
> PISTOL. Master Fer! I'll fer him, and firk him, and *ferret* him: discuss the same in French unto him.
> BOY. I do not know the French for fer, and *ferret*, and firk."
> *King Henry V.* Act iv., Scene 4.

> "BRUTUS. * * * And Cicero
> Looks with such *ferret* and such fiery eyes,
> As I have seen him in the Capitol,
> Being cross'd in conference by some senators."
> *Julius Cæsar.* Act i., Scene 2.

THE WEASEL, *Mustela vulgaris.*

The old axiom of "Give a dog a bad name and hang him" may be well bestowed on our poor little friendly weasel. That he is an egg-sucker no one would be rash enough to deny; but I know, from personal knowledge of his habits, that the good he does in the destruction of field mice far outbalances any harm he may do to the young of game or poultry. I never destroy a weasel or allow one to be destroyed if I can prevent it, yet I defy any one to show a better head of either ground or winged game on the same extent of open country than I can. That the weasel bore a bad character, even in Shakspeare's time, will appear from the following quotations.

Its propensity for eggs is referred to by the melancholy Jaques, who says—

> "I can suck melancholy out of a song, as a *weasel* sucks eggs."
> *As You Like It.* Act ii., Scene 5.

"As quarrelous as a *weasel*" (*Cymbeline*, Act iii., Scene 4) may be termed a Shakspearian proverb.

Even at the present day, many sportsmen and country people, who really ought to know better confuse this animal with the weasel; we are, therefore, less surprised that Shakspeare does not mention the stoat or ermine. No doubt much of the mischief attributed to the weasel could be rightly laid to the credit of its larger and more powerful congener, the stoat.

THE OTTER, *Lutra vulgaris.*

Only once do we find that Shakspeare mentions the otter, and then apparently only to record the ancient belief that it was a very mysterious animal—a kind of hybrid between fish and beast. That he was better informed is pretty evident from the fact of his entrusting the description of it to our amusing friend Falstaff (*Henry IV.*, Part I., Act iii., Scene 3).

THE BADGER, *Meles taxus.*

The very cruel practice, unworthy the name of sport, of badger-baiting, could scarcely have been indulged in in Shakspeare's time, otherwise we should probably find some allusion to it. Once only does our poet mention this poor persecuted animal, under its more northern provincial name of "brock," and then only as an epithet. In the amusing play *Twelfth Night* (Act ii., Scene 5), Malvolio, reading a letter purposely dropped for his perusal, puts on airs, and places such a construction on the contents of the letter as to annoy Sir Toby Belch, who exclaims, but not loud enough for Malvolio to hear him, "Marry, hang thee, *brock!*"

THE BROWN BEAR, *Ursus arctos.*

Either this species or *U. isabellinus* would probably be the bear with which Shakspeare would be most familiar. Bear-baiting seems to have been a very popular amusement about that period and for many years subsequently. If I remember rightly, there was a "bear garden" situated somewhere on the south side of the Thames, not far from the south end of one of the bridges—Southwark, I think. I have seen it marked in old maps of London. Some account of "bear gardens" may be found in Strutt's 'Sports and Pastimes."

In the *Merry Wives of Windsor* (Act i., Scene 1), Slender asks of Anne Page—

> "Why do your dogs bark so? Be there *bears* i' the town?
>
> ANNE. I think there are, sir; I heard them talked of.
>
> SLENDER. I love the sport well; but I shall as soon quarrel at it as any man in England. You are afraid if you see the *bear* loose, are you not?
>
> ANNE. Ay, indeed, sir.
>
> SLENDER. That's meat and drink to me now. I have seen Sackerson* loose twenty times, and have taken him by the chain; but, I warrant you, the women have cried and shriek'd at it, that it passed; but women, indeed, cannot abide 'em: they are very ill-favoured rough things."

Again, in *Twelfth Night* (Act i., Scene 3), Sir Andrew Aguecheek, in lamenting his lack of education, exclaims—

> "What is *pourquoi?* do, or not do? I would I had bestowed that time in the tongues, that I have in fencing, dancing, and *bear-baiting*."

Shakspeare mentions bears upwards of fifty times. The following spirited description may probably be intended for "a find" with a Syrian bear, *Ursus isabellinus*:—

"HIPPOLYTA. I was with Hercules and Cadmus once,
When in a wood of Crete they bay'd the *bear*
With hounds of Sparta: never did I hear

---

* The name of a celebrated fighting bear.

> Such gallant chiding, for, besides the groves,
> The skies, the fountains, every region near
> Seem'd all one mutual cry: I never heard
> So musical a discord, such sweet thunder."

In a notice of the quadrupeds mentioned by Shakspeare, some allusion should be made to the marine Mammalia. Whales are often mentioned; sometimes as the "huge leviathans" (*Two Gentlemen of Verona*, Act iii., Scene 2), but it will be sufficient to give a couple of quotations and identify the species referred to as—

THE GREENLAND WHALE, *Balæna mysticetus.*

The following apt simile occurs in *Pericles* (Act ii., Scene 1):—

> "3RD FISHERMAN. * * * Master, I marvel how the fishes live in the sea.
>
> 1ST FISHERMAN. Why, as men do a-land—the great ones eat up the little ones. I can compare our rich misers to nothing so fitly as to a *whale:* 'a plays and tumbles, driving the poor fry before him, and at last devours them all at a mouthful: such *whales* have I heard on o' the land, who never leave gaping, till they've swallowed the whole parish, church, steeple, bells, and all."

Of course poor Falstaff could not escape the opprobrious epithet of "whale." Mrs. Ford asks—

> "What tempest, I trow, threw this *whale*, with so many tuns of oil in his belly, ashore at Windsor?"
>
> *Merry Wives of Windsor.* Act ii., Scene 1.

THE DOLPHIN, *Delphinus delphis.*

We often find the mythical "mermaid" associated with such friends as the seals and dolphins; so Shakspeare says, through Oberon—

> "My gentle Puck, come hither. Thou remember'st
> Since once I sat upon a promontory,
> And heard a mermaid on a *dolphin's* back,
> Uttering such dulcet and harmonious breath,
> That the rude sea grew civil at her song;
> And certain stars shot madly from their spheres,
> To hear the sea-maid's music."
>
> *Midsummer Night's Dream.* Act ii., Scene 2.

THE PORPOISE, *Phocæna communis.*

The superstition of many old seafaring men is well shown in the following quotation—the only instance wherein Shakspeare mentions the porpoise:—

> "1st Fisherman. Alas, poor souls! it grieved my heart to hear what pitiful cries they made to us to help them, when, well-a-day, we could scarce help ourselves.
>
> 3rd Fisherman. Nay, master, said not I as much when I saw the *porpus*, how he bounced and tumbled? They say they are half fish, half flesh: a plague on them! they ne'er come, but I look to be washed."
>
> *Pericles.* Act ii., Scene 1.

(To be continued.)

ORNITHOLOGICAL NOTES FROM DEVON AND CORNWALL.

By John Gatcombe.

On the 7th March, wind N.N.W., blowing strong but fine, Black Redstarts were still on the coast, and Titlarks might be seen mounting in the air as in the breeding season. Curlews were on the move, and very clamorous when passing overhead at night. By the 14th, Grey Wagtails had assumed the black throat, Herring Gulls and some Razorbills were in full breeding dress, and Lesser Black-backed Gulls were plentiful, in pairs; adult Mews had also arrived, but the Black-headed Gulls had by that date left for their breeding quarters. Great Black-backed Gulls were not so numerous as usual this season, no doubt owing to the mildness of last winter.

I feel confident that on March 14th I saw Richard's Pipit on the grassy slope of a cliff, but did not get very near in consequence of its flying off inland immediately it caught sight of me. However, I think I could hardly have been mistaken, being so well acquainted with the appearance and flight of the species in a wild state, having at different times met with no less than seven examples in the neighbourhood of Plymouth, besides two others that were brought to our birdstuffers in the flesh. Two or three Greater Spotted Woodpeckers were seen in this locality about the same date. On the 29th there was a tremendous gale from the E.N.E., with heavy showers of snow, notwithstanding which I observed a solitary Sand Martin arrive from sea, flying northwards; and the same afternoon many Wheatears made their appearance on the coast.

On April 2nd there were some Golden Plovers in the market with completely black breasts; and on the same day I visited a Raven's nest on the coast near Bovisand, in which were three young birds, fully fledged, looking nearly as large as their parents, who kept flying round, croaking, falling, and turning nearly over in the air in great excitement. I also watched a pair of Red-throated Divers, in full breeding plumage, swimming off the rocks in the Sound—rather a late date for them to remain in this locality. I may here remark that Red-throated Divers have become very scarce on our immediate coast within the last few years.

On April 27th I visited the cliffs at Wembury, and found all the Herring Gulls assembled at their usual nesting place, but observed only one nest. I have no doubt, however, that there were many others which could not be seen. There were some splendid Crested Shags, in full breeding plumage, on the rocks below, and many Kestrels about, but, I am sorry to say, no Peregrines.

Half-a-dozen Swifts made their appearance on May 1st, hawking for insects rather high in the air over Stonehouse, and by the following day many flocks of Whimbrels had arrived on the banks of the River Lynher. I understand, however, that some were heard passing overhead nearly a week previously. On the 4th I remarked a White Wagtail, *Motacilla alba*, in a newly-ploughed field, and again paid a visit to the Raven's nest, but found the young had flown. A dealer in live birds at Plymouth showed me a fine young Raven which had been sent from Cornwall, and told me that the coastguardsman, who had taken it when robbing another nest a few days afterwards, had fallen from the cliff and was killed on the spot. Six lives have already been sacrificed during the past month in taking the eggs and young of Ravens and Gulls—four on the coasts of Devon and Cornwall, and two at St. Abb's Head, on the coast of Scotland. By the way, I do not understand why the eggs of sea-fowl are not protected as well as the birds themselves. The Lesser Black-backed Gulls by this date had almost all left for their breeding stations, and so had the Mews, but I do not know a nesting locality for either species on the coasts of Devon or Cornwall, certainly not within a great many miles of Plymouth. A short time since I remarked two immature Herring Gulls pecking at and apparently feeding on some decayed cabbage-leaves which had been left on a mudbank by the receding tide—a habit I had never before witnessed in any of the Gull tribe.

Early in May I visited the breeding haunts of the Herring Gulls at Rhame Head, on the coast of Cornwall, a few miles from Plymouth, and found a great many birds sitting, but could see no young. Several Ravens and Kestrels were flying about the locality. A friend told me that some time since he shot a gull, in the gizzard of which he found a large whiting-hook firmly fixed, but, judging from the condition of the bird, it did not appear to have suffered any ill effects.

——o——

OCCASIONAL NOTES.

Hunting the Wild Cat.—At page 202, Mr. Henry Reeks has expressed the opinion that hunting the wild cat was never considered royal sport, for otherwise it would have been noticed by Shakespeare. In this I venture to think he is mistaken, for in many old royal grants which I have met with, giving license to enclose and liberty to hunt, the wild cat is particularly mentioned and included amongst the beasts of chase. William Beriwere, who was a great favourite with King John in consequence of his knowledge in the art and mysteries of venery, received a license from that monarch to enclose his woods at Joare, Cadelegh, Raddon, Ailesberie and Burgh Walter, with free liberty to hunt the hare, fox, *cat*, and wolf throughout all Devonshire.* From a charter of liberties granted by the same King, when Earl of Morton, to the inhabitants of Devonshire, it appears that the wild cat was at that time included amongst the "beasts of venery" in that county. The original deed, which is still preserved in the custody of the Dean and Chapter of Exeter, is under seal, and provides *inter alia* as follows:—"Quod habeant canes suos et alias libertates, sicut melius et liberius illas habuerunt tempore ejuset. Henrici regis et reisellos suos, et quod capiant capreolum, vulpem, *cattum*, lupum, leporem, lutram, ubicunque illa invenirent extra regardum forestæ meæ."† In 1286 one carucate of land in the county of Huntingdon was held by the serjeanty of hunting the wolf, fox and *wild cat*, and driving away all vermin out of the forest of the King in that county.‡

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* Dugdale's 'Baronage,' vol. i., p. 701.

† "Ex Autographo penes Dec. et Capit. Exon." From Bp. Lyttelton's Collections. Quoted by Pennant, 'British Zoology,' vol. ii., p. 308 (1812).

‡ Plac. Coron. 14 Edw. I., Rot. 7, dorso; Blount, 'Ancient Tenures,' p. 230.

In 1297 John Engaine died, seized, *inter alia*, of certain lands in "Pytesle," in the county of Northampton, found to be held of the King by the service of hunting the wolf, fox, *wild cat*, badger, wild boar, and hare; and likewise the manor of Great Gidding, in the county of Huntingdon, held by the service of catching the hare, fox, *wild cat*, and wolf, within the counties of Huntingdon, Northampton, Buckingham and Rutland.* In 1368 Thomas Engaine, dying without issue, was found to be seized of fourteen yardlands and meadow, and 14s. 4d. rent, in Pightesle, in the county of Northampton, held by the service of finding, at his own proper cost, certain dogs for the destruction of wolves, foxes, martens, *wild cats*, and other vermin within the counties of Northampton, Rutland, Oxford, Essex and Buckingham.† During the reign of Henry IV., Sir Thomas de Aylesbury, knight, and Catherine his wife, held of the King, *in capite*, the manor of Laxton, *inter alia*, with the appurtenances in the county of Northampton, by "grand serjeanty," *viz.*, by the service of taking wolves, foxes, *wild cats*, and other vermin in certain counties named. Robert Lindsay, in his 'Chronicles of Scotland' (vol. ii., p. 346), informs us that in 1528 the Earl of Athol entertained King James V. with a great hunt which lasted three days. "It is said, at this tyme, in Atholl and Stratherdaill boundis, thair was slaine threttie scoir of hart and hynd, with other small beastis, sich as roe and roebuck, woulff, fox and *wyld cattis*." A century later, Sir Robert Gordon, in his 'Genealogical History of the Earldom of Sutherland from its origin to the year 1630,' especially mentioned the wild cat amongst the beasts of chase in Scotland at that period. He says the forests and "schases" in the county of Sutherland were "verie profitable for feiding of bestiall, and delectable for hunting, being full of reid-deer and roes, woulffs, foxes, *wyld catts*, brocks, skuyrells, whittrets, weasels, otters, martrixes, hares, and fumarts." Much more evidence of this kind might, no doubt, be adduced, but the above will perhaps suffice to illustrate the point in question.—J. E. HARTING.

WEASEL CARRYING ITS YOUNG.—I was told by Mr. John Wise, of Malton, land surveyor, that as he was surveying at Bainton some years ago he saw an old weasel carrying a young one in her mouth. He aimed a blow at her with his staff, but missed her, causing her, however, to drop the young one and run away a short distance. He picked up the young one, and found that it was fast asleep. The old one had now come back, and was running about his legs in a very excited way. He woke up the young one, when it immediately "showed fight," and would have bitten him had he not dropped it, whereupon the mother took it up again and ran off with it.—WALTER STAMPER (Oswaldkirk, York).

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* Dugdale's 'Baronage,' vol. i., p. 466. See also the 'Rotuli Hundredorum,' ii., p. 627.

† Rot. fin. 42, Edw. III., m. 13. Dugdale's 'Baronage,' vol. i., p. 467; and Blount 'Ancient Tenures,' p. 231.

GOATS EATING TOBACCO.—Mr. Reeks mentions (p. 206) a case of a goat eating tobacco with impunity. I can confirm this statement. A goat belonging to Mr. Barr, yacht-builder, of Wivenhoe, was very fond of eating tobacco, and if a pouch was shown to him would follow the owner about until he had some tobacco given him. I have frequently given him half-an-ounce, and on one occasion I left my pouch, containing between two and three ounces, open within his reach, which in a few minutes he cleared without doing him the least harm.—A. H. SMEE (7, Finsbury Circus).

CATTLE EATING YEW.—*Apropos* of the notes which have already appeared on this subject (pp. 177, 206, 207) it may be observed that Gilpin, in his 'Remarks on Forest Scenery' (Sir T. D. Lauder's edition, vol. i., p. 191), states that "Cattle and sheep eat yew twigs greedily, and with impunity when they crop them from the tree or bush. But these animals have been frequently poisoned by eating the clippings of a yew hedge which have lain for a little time. This can only be accounted for by the supposition that some chemical change takes place in the arrangement of the juices of the plant, which generates a poison not pre-existing in it." Gilpin is mistaken, however, in supposing that the poisonous effects result only from cropping the living tree. In addition to the instances already cited (p. 177), I am reminded of an accident which occurred in Yorkshire a few years since, when three valuable horses were destroyed by eating the leaves of a growing yew tree, which they had been incautiously allowed to get at through the carelessness of a tenant in not repairing his fences.—J. E. HARTING.

NOTES FROM THE ISLE OF WIGHT.—Though nothing rare has occurred here of late, Mr. Smith, the Newport taxidermist, has received a Little Bittern which was picked up at Brixton, in a dying state, on the 2nd of May last year. It is a male, in perfect plumage, 15½ inches in length, and 21½ inches in extent of wing. Swallows, this spring, were unusually late in appearing here, none having been observed till the middle of April, and no Martins till the beginning of May. Both species have become less numerous of late years, and few breed here now, though they are to be seen in countless numbers during the autumnal migration. Neither Chiffchaff nor Willow Wren was seen till the first week in April. Several Swifts were observed on the 9th of May flying about the Carisbrook church-tower. Young Starlings were first seen on the wing on the 25th of May. How the young manage to fly up or creep up chimney-pots over three feet in height is wonderful, but their very powerful claws and sharp nails no doubt aid them in doing so. I may record here the strange death of a

House Sparrow, lately found hanging by one leg from the branch of a tree in the garden, the claws having become entangled in a confused mass of thread which it was in the act of conveying to the nest. A white Sparrow has lately been observed here, and some are met with in most seasons, but these are invariably birds of the year, the white disappearing wholly or in part after the first moult. A nest of the Great Tit was lately found in a hollow pedestal, the entrance to which was but an inch and a quarter in diameter; and though the pedestal was removed and then replaced, the birds did not forsake the nest, and the six eggs were duly hatched. A pair of Robins built a nest and reared their young in a spare room of a house in the town, having entered by a broken window. The nest was placed on an iron bedstead resting against the wall.—HENRY HADFIELD (Ventnor, Isle of Wight).

ABNORMAL NESTING OF THE NUTHATCH.—While staying with my uncle, Colonel C. L. Cocks, about three miles west of Liskeard, I observed, on May 24th and following days, a Nuthatch frequently going in and out of a small hole in the perpendicular face of a bank opposite the front of the house, perhaps twenty feet from the ground, and three or four from the top, in which it evidently had a nest with young hatched. On referring to "Yarrell" (3rd edition), I find he only mentions holes in trees as the site of their nests; and the Rev. C. A. Johns, in his "British Birds in their Haunts," says the nest is "invariably placed in the hole of a tree." Liskeard is also mentioned by Yarrell as the most westerly point where they are generally found. My uncle called my attention to the fact of their feeding on the grubs in oak-apples; and I subsequently picked up several which had been pecked by a bird's beak, and the grubs were gone; and though I did not actually see a Nuthatch at work upon one, I think it will be allowed that they are by far the most likely birds to have done this,—far more so than the tits.—ALFRED H. COCKS (Great Marlow, Bucks).

[Some years ago, we remember to have seen the nest of a Nuthatch in a brick wall. The birds entered by an opening left by a displaced brick; and this hole being too large to please them, they reduced it by plastering mud all round the edge until it was just large enough to admit the birds. A still more remarkable nest of the Nuthatch came under our observation a year or two later. This nest was formed entirely of clay, and was of considerable size and weight. It was built in a haystack, where the grass-stems and bents, passing through the clay at intervals, contributed to support it in its singular position. A notice and engraving of this nest was, at our request, published in 'The Field' at the time.—ED.]

CHIFFCHAFF'S NEST IN A HOLLY.—In the last week in May I found a Chiffchaff's nest three feet above the ground in a young holly in the wood called St. Catherine's, close to Lucan. It was made of the materials of which the Chiffchaff's nest is usually composed, and contained six eggs. Professor Newton mentions, in his edition of Yarrell, two instances in which this bird has been known to build in other situations than on the ground, and also refers to an instance of the Willow Wren having built at some distance from the ground. Probably these two species may nest off the ground more frequently than has been observed, or perhaps they may have done so, hoping to be more secure, after having had their nests on the ground destroyed or robbed.—J. E. PALMER (Lucan, Co. Dublin).

HOW TO FORM A ROOKERY.—Our gardener once told me that he had on different occasions induced Rooks to build near a house in trees where previously there had been no nests, by fixing, in the fork of a branch near the top of the tree, round platforms of strong twigs. These were made out of old besoms or brooms, and served as foundations for the nests.—WALTER STAMPER (Oswaldkirk, York).

NESTING HABITS OF THE WATER OUZEL.—In reference to the breeding of the Water Ouzel (p. 213), the 9th of April is by no means an early date on which to take the full complement of eggs. Here they build and many lay before the end of March, and it is no unusual thing to find eggs by the middle of that month. On the 4th April last, a friend and I found some six or seven nests. One had no eggs in it, two others had full complements of freshly-laid eggs; another had eggs hard set; and two more had young birds.—J. A. HARVIE-BROWN (Dunipace House, Larbert, N. B.)

EARLY NESTING OF THE KINGFISHER.—With regard to the date of laying by the Kingfisher (p. 214), I have taken fresh eggs from a nest here on the 25th April. The tunnel was remarkably dirty, and the fish-bones in it were rotten and crawling with maggots.—ID.

TURTLE-DOVES BUILDING NEAR A DWELLING-HOUSE.—As usual, a pair of Turtles (*Columba turtur*) are breeding in my grounds. They were first heard on or about the 1st of June, and are nesting in a Wych Elm not very far from the house.—THOMAS BELL (The Wakes, Selborne).

OCCURRENCE OF THE GREY PHALAROPE IN CORNWALL IN MAY.—This Phalarope, *Phalaropus platyrhynchus*, was shot near Par a short time since with its summer plumage almost assumed, the under parts being—with the exception of a small admixture of white on a portion of the breast—of a brownish red from the chin to the vent. I do not know of a single instance of this species remaining in the southern latitudes in the breeding season—certainly there is no recorded instance of its occurrence in Cornwall during that season. It appears pretty regularly in the autumn and sometimes late on in the winter on our coasts in uncertain numbers. Singularly enough, the specimen now under notice has only one leg; the other is entirely gone, and nothing remains to show that the limb ever existed. Whether this has anything to do with its southern migration I cannot say, but the bird appeared in other respects perfect in form and condition.—E. H. Rodd (Penzance).

[The Grey Phalarope, when going northward to breed in spring, apparently travels by a different route to that which it takes when migrating southward in autumn. At the latter season it passes through the British Islands often in large numbers, but in spring it is very rarely seen in the red plumage. This change of route is very curious, and deserves investigation.—Ed.]

Cuckoo Laying Two Eggs in One Nest.—About two years ago, I found two Cuckoo's eggs in a Hedge-Sparrow's nest, both apparently laid by one bird, as neither was similar to any other Cuckoo's egg I have ever taken, but more resembled the Pied Wagtail's eggs in colour. I mention this as in the Introduction to "Montagu's Dictionary of British Birds," it is stated that "Where two eggs have been found in one nest, they certainly were laid by different birds." I think the above affords strong proof that one Cuckoo does sometimes lay two eggs in the same nest.—Arthur Beale (Chiddingstone, Kent).

Blackcap in County Dublin.—On two occasions, during the second week in June, I observed a male Blackcap warbler (*Sylvia atricapilla*) in my garden by the Liffey, near Lucan, Co. Dublin. On both occasions it was feeding on cherries, under a net which hung in the tree. I never saw it in this county before.—J. F. Shackleton (Anna Liffey House, Lucan).

[The Blackcap, although a regular summer visitant to Ireland, appears to be very local there.—Ed.]

A New Fossil Bird.—From a recent Bulletin of the 'United States Survey of the Territories,' it appears that the remains of a passerine bird of high organisation have been discovered at Florissant, in Colorado. Although certain portions of the head are wanting, the remains include the greater part of the skeleton and nearly all the bones of the anterior and posterior extremities. The impressions of the wings and tail on the rock are so clear as to show even the shafts and barbs of the feathers. The bird was evidently of arboreal habits and well-developed powers of flight, and although the absence of bill renders it impossible to decide with certainty the family to which the species may have belonged, it is thought to be allied to the Finches. Mr. J. A. Allen has described it under the name *Palæospiza bella*.

A Rare Crustacean from Mount's Bay, Cornwall.—I have just had brought to me the tubes of a large colony of *Cerapus* of some sort, found attached to a rock near St. Michael's Mount. I am unable to determine the precise species, as my informant, with the best possible intentions, carefully removed every single inhabitant before he brought the specimens to me, but his account of how he removed them fully bears out the quarrelsome character given by naturalists to *Cerapus abditus*. He tickled them with a shoemaker's bristle until they grabbed it, and then he dragged them out. As far as I can ascertain, this is the first record of the occurrence of this Crustacean in Mount's Bay. My informant says he saw another colony close by the first, both just under dead low water at spring tides.—THOMAS CORNISH (Penzance).

DEATH OF MR. W. C. HEWITSON, F.L.S.—It is with regret that we have to announce the death of William Chapman Hewitson, the well-known author of a standard work on British Birds' Eggs. Born in 1806, in the North of England, he acquired an ardent taste for Natural History, and in his early studies was associated with Mr. John Hancock, of Newcastle-on-Tyne, an equally well-known ornithologist, with whom he made a tour in Norway, for the purpose of studying the nidification of several birds, such as the Redwing and Fieldfare, whose eggs at that date were undescribed, although the birds themselves as annual winter visitants to this country were well known. In this tour he was very successful, and British ornithologists owe him a debt of gratitude for the many additions which he was instrumental in making to their knowledge of Oology. He was quite as well known as an entomologist, and as the owner of a splendid collection of exotic butterflies, which he has bequeathed to the British Museum. In conjunction with the late Edward Doubleday, he commenced an illustrated folio work on 'The Genera of Diurnal Lepidoptera,' which he supplemented by another work in five quarto volumes on 'Exotic Butterflies.' The illustrations to these works, as well as to many separate articles in various periodicals, were all drawn by himself, and are admitted by entomologists to be unequalled for accuracy of detail and beauty of colouring. Those who had the pleasure of his acquaintance will regret that they can no more share the genial hospitality and pleasant welcome which was always accorded to them at his beautiful home in Oatlands Park, where, at the ripe age of seventy-two, he died on the 28th May last.

DEATH OF PROFESSOR HENRY.—Another naturalist has passed away in the person of Professor Joseph Henry, LL.D., the Secretary and Director of the Smithsonian Institution, Washington, who died in that city on May 13th last. Professor Henry was born in Albany, in the State of New York, December 17th, 1799. He became Professor of Mathematics in the Albany Academy in 1826; Professor of Natural Philosophy in the College of New Jersey, at Princeton, in 1832; and was elected the first Secretary and Director of the Smithsonian Institution in

1846. He received the honorary degree of Doctor of Laws from Union College in 1829, and from Harvard University in 1851. He was President of the American Association for the Advancement of Science in 1849; was chosen President of the United States National Academy of Sciences in 1868: President of the Philosophical Society of Washington in 1871; and Chairman of the Lighthouse Board of the United States in the same year; the last three positions he continued to fill until his death. Prof. Henry made contributions to science in electricity, electro-magnetism, meteorology, capillarity, acoustics, and in other branches of physics: he published valuable memoirs in the Transactions of various learned societies of which he was a member; and devoted thirty-two years of his life to making the Smithsonian Institution what its founder intended it to be, an efficient instrument for the "increase and diffusion of knowledge among men." He is succeeded in the post of Secretary of the Smithsonian Institution by Professor Spencer Baird.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

Linnean Society of London.

Annual General Meeting, May 24, 1878.—Professor **Allman**, F.R.S., President, in the chair.

The President, in his Anniversary Address, in accordance with the plan he had adopted on previous occasions, selected for exposition a group of organisms—the *Polyzoa*—on which recent investigations had thrown more than usual light, and gave a *resumé* of the principal discoveries by which our present knowledge of the group has been brought about. Commencing with their anatomy and development, and certain important features in their systematic grouping, he pointed out the advance made in our acquaintance with their primary groups by the labours chiefly of Busk and Nitsch. Discussing certain disputed points which recent investigations have tended to clear up, such as the nature of the "Brown Bodies," and the so-called "Colonial Nervous System," he maintained that the evidence of such investigations was mainly in favour of the "Brown Bodies" being merely the residuum of degraded and withered polypides, and that they have no real morphological or physiological importance; and further, with Nitsch, Joliet, and Busk, that the so-called "Colonial Nervous System" was merely an irregular plexus of cellular and protoplasmic cords and filaments derived from the walls of the zoœcium, or polypide-cell, and that it has nothing to do with a true nervous system. Joliet has proposed for it the convenient name of "Endosarc," and refers to it the origin of the reproductive elements of the new polypide buds, and of certain minute corpuscles which are found floating free in the liquid which fills the cavity of the zoœcium,—a view which may be regarded as too exclusive. He (Professor Allman) had, not long since, an opportunity of examining the remarkable organism known as *Cyphonantes*, a singular little free swimming animal found in the open sea. It is of a compressed pyramidal shape, its soft parts being included in a bivalve shell in the manner of certain *Entomostraca*. It has an organization of considerable complexity, being provided with a complete alimentary canal, with accessory glands, and with certain organs of extremely enigmatical import. Schneider attempted to show that *Cyphonantes* was the larva of a polyzoon, and he announced the startling fact that before its transformation into the adult, it becomes totally disorganised, every trace of structure disappearing, and the entire animal becoming reduced to a homogeneous mass of protoplasm; and this, notwithstanding the complex structure of *Cyphonantes*,—more complex, indeed, than the German zoologist had imagined. It is in this homogeneous, structureless mass of protoplasm that the new polypide arises, and the whole becomes then metamorphosed into the form of the adult. Strange as this history may appear, it has been to a certain extent confirmed by the researches of Nitsch and Joliet, and he (the President) felt that, in the face of the evidence afforded by those researches, he would not be justified in still urging the objections which, chiefly on theoretical grounds, he had formerly offered. Finally, his address took up the question of "Individuality," or the relation to the polyzoal colony, and he maintained, in the somewhat modified form resulting from the researches of Nitsch, the view which he had long ago brought forward, and which has since been generally accepted by recent investigators, namely, that the zoœcium or cell in which the polypide is lodged must be regarded as having a zooidal individuality, independently of the polypide, which has also a zooidal individuality of its own, and that the two thus form a compound element which becomes associated with similar ones in order to form the colony. This compound animal is thus composed of two zooidal individuals,—zoœcium and polypide; on the zoœcium devolving the functions of sexual and non-sexual reproduction, and on the polypide that of nutrition.

At the conclusion of his Address, Prof. Allman called attention to some living examples of Tree Frogs (*Hyla arborea*) which he had obtained in the South of Europe. Those now exhibited to the Fellows convincingly showed the remarkable change of colour which this species of Frog is known to possess, some of them being green, others bright blue. This change of hue is due to certain pigment-corpuscles, the precise nature of which Prof. Allman is at present engaged in investigating.

The Report on publications was read by the Secretary, and that on the balance-sheet by Dr. R. C. A. Prior. Afterwards the Treasurer (Dr. J. Gwyn Jeffreys) read his statement of the accounts, &c., of the past financial year, 1877. This showed a highly satisfactory result, a balance of £46 13*s*.

remaining in hand after payment of all current expenses, while the sum of £700 had been invested since the last Annual Report.

The alterations in the Bye Laws (concerning an increase in the rate for Fellows compounding) proposed by the Council on the 18th of April, having been formally hung up in the Common Meeting Room of the Society, and duly read by the President and by the Vice-President in the chair at the last two General Meetings of the Society, were put to the ballot, and confirmed by the Fellows at large in the terms of the charter.

The senior Secretary then announced the death, during the past year, of fourteen Fellows, including four foreign members. Against this, thirty-eight new Fellows and five foreign members had been elected. Among the deceased were several men of repute in the scientific world. Mr. Henry Adams, well known as a conchologist; Dr. Elias Fries, of Upsala, a large contributor to our knowledge of the Swedish Flora, especially its cryptogamic botany; Mr. Andrew Murray, chiefly credited as an entomologist, but nevertheless well versed in several kindred branches, and particularly known by his work, 'On the Geographical Distribution of Mammals;' Prof. Parlatore, of Florence, an eminent Italian botanist; Mr. H. Fox Talbot, whose name is indelibly connected with photography; Dr. R. Visiani, of Padua, a distinguished botanist; Dr. H. A. Weddell, of Potiers, whose important contributions to the Flora of the Cordilleras and on the *Cinchona* tribe are well known; and Mr. T. Vernon Wollaston, the distinguished author of "*Insecta Maderensia*" and "*Testacea Atlantica.*"

The following gentlemen were elected into the Council:—Mr. John Ball, Dr Thomas Boycott, Mr. Frederick DuCane Godman, Dr. Albert Günther, and the Rev. George Henslow, in the room of the subjoined, who retired by rotation—Mr. J. G. Baker, Dr. W. B. Carpenter, Mr. Henry Lee, Prof. W. K. Parker, and Mr. S. J. A. Salter.

The President and officers of the Society were all re-elected.

Zoological Society of London.

June 4, 1878.—Prof. Flower, F.R.S., V.P., in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of May, 1878, and called special attention to two male Lesser Birds of Paradise (*Paradisea minor*), purchased on the 2nd of May; a Copper-headed Snake (*Cenchris centortrix*), presented by Dr. F. Painter, F.Z.S., of South Pittsburg, Tennessee, U.S.A., and a Hairy or Andean Tapir (*Tapirus roulini*), obtained by exchange.

Mr. Sclater exhibited a young specimen of Temminck's Manis (*Manis Temmincki*), and read a note describing habits of this animal in captivity by Mr. F. Holmwood, Assistant Political Agent at Zanzibar.

Mr. Sclater also called attention to the extraordinay mimicry of the true rectrices by the elongated upper tail-coverts in *Ciconia maguari* and *C. episcopus* as observable in the living examples of these birds in the Society's Gardens.

Mr. Edward R. Alston exhibited, on behalf of Dr. Elliott Coues, two specimens of *Synaptomys Cooperi.* To this species—the type of *Synaptomys*, proposed in 1867 by Professor Baird as a subgenus of *Myodes*, full generic rank had been accorded by Dr. Coues in 1874. The present specimens were, so far as was known, the first typical specimens sent to Europe.

Professor Huxley read a memoir on the Cray-fishes, in which he gave a review of the various generic divisions of this group of Podophthalmous Crustacea, and pointed out how remarkably these divisions corresponded with their geographical distribution.

Professor W. H. Flower exhibited the skull of a two-horned Rhinoceros from Tipperah, and read a note on the peculiarities of its structure.

A communication was read from Messrs. Godman, Salvin and Druce containing a catalogue of the Lepidoptera collected by Mr. S. N. Walter, in the Island of Billiton.

Messrs. Godman and Salvin also read a list of the butterflies collected in Eastern New Guinea and some neighbouring Islands by Dr. Comrie, during the voyage of H.M.S. ' Basilisk.'

Mr. A. G. Butler read a paper containing the description of a new species of the orthopterous genus *Phylloptera* from Madagascar, which he proposed to name *Phylloptera segonoides.*

Messrs. Sclater and Salvin read a report on the collection of Birds made during the voyage of H.M.S. ' Challenger.' The present communication, forming the eleventh of the series, contained a description of the Steganopodes and of the Impennes. Of the first group the collection contained thirty-three specimens belonging to eight species; of the second, thirty-seven specimens belonging to six species.

Prof. E. Ray Lankester read a paper in which he gave an account of the structure of the hearts of *Ceratodus, Protopterus*, and *Chimæra*, with an account of certain undescribed pocket-valves in the conus arteriosus of *Ceratodus* and of *Protopterus.*

June 18, 1878.—ARTHUR GROTE, Esq,, Vice-President, in the chair.

The Secretary read extracts from a letter addressed to him by Mr. E. L. Layard, containing remarks on two species of New Caledonian birds.

A second communication from Mr. Layard stated that there was an example of the recently-described Woolly Cheetah (*Felis lanea*) in the South African Museum at Cape Town.

Mr. Edward R. Alston read a paper "On the Squirrels of the Neotropical Region," in which he recognised twelve out of fifty-nine described species, and re-described two, *Sciurus rufo-niger*, Pucheran, and *S. pusillus*, Geoffroy, which had been recently overlooked.

Mr. Sclater exhibited and made remarks on a third collection of Birds from Duke of York Island, New Britain and New Ireland, which he had received from the Rev. George Brown. Amongst them was an example of a new Fruit-pigeon proposed to be called *Carpophaga melanochroa.*

A communication was read from Dr. M. Watson, containing a description of the male generative organs of *Chlamydophorus truncatus* and *Dasypus sexcinctus.*

A communication was read from Professor Garrod on certain points in the anatomy of Levaillant's Darter (*Plotus Levaillanti*).

A communication was read from Messrs. Garrod and Turner on the gravid uterus and placenta of *Hyomoschus aquaticus.*

A communication was read from Mr. Moore containing the descriptions of new Asiatic butterflies of the family Hesperiidæ.

A second communication from Mr. Moore gave a list of the Lepidopterous Insects collected by the late Robert Swinhoe in the island of Hainan.

A communication was read from the Marquis of Tweeddale, being the tenth of his contributions to the ornithology of the Philippines. The present paper gave an account of the collection made by Mr. A. H. Everett in the island of Bohol. The collection contained representatives of forty-seven species. Although all of these were previously known, seven of them had not been before recorded as being inhabitants of the Philippines.

Dr. O. Finsch read the description of a new species of Starling from Lake Marka-kul, in the Chinese High Altai, which he proposed to name *Sturnus Poltaratzskyi*, after Gen. Poltaratzsky, Governor of Semipalatinsk.

A communication was read from Mr. H. W. Bates containing the description of new species of Coleopterous Insects (*Geodephaga* and *Longicornia*) taken by the late Dr. Stoliczka during the Forsyth Expedition to Kashgar in 1873–74.

A communication was read from Dr. G. Hartlaub in which he gave the description of a new species of *Notauges* (*N. Hildebrandti*) of Cabanis, M., discovered by Mr. Hildebrandt at Ikanga in Ukamba, Eastern Africa.

A communication was read from Lieut.-Col. R. H. Beddome, giving the description of a new Batrachian from Southern India belonging to the family Phryniscidæ, which he proposed to call *Melanobatrachus indicus.*

Sir Victor Brooke, Bart., exhibited and made remarks on a fine head of the male *Gazella Granti*, originally described from sketches made by Capt. Speke during Speke and Grant's Expedition. The present specimen had been shot by Mr. Arkwright about eighty miles from Ugogo, in Eastern Africa.

A communication was read from Professor J. V. Barboza du Bocage, containing a list of the Antelopes observed in Angola.

A communication was read from Mr. Carl Bock, in which he gave the description of two new species of shells from China and Japan.

A communication was read from Mr. Edgar A. Smith, containing the description of five new shells from the island of Formosa and the Persian Gulf, with notes upon some known species.

Messrs. Godman and Salvin read the descriptions of some apparently new species of Butterflies from New Ireland and New Britain, received from the Rev. G. Brown.

Mr. O. Salvin read the twelfth of a series of reports on the collection of birds made during the voyage of H.M.S. 'Challenger.' The present paper contained an account of the Procellariidæ, collected during the Expedition. Eighty specimens had been obtained belonging to twenty-two species.

Mr. Sclater read some supplementary notes on the Curassows now or lately living in the Society's Gardens.

Mr. J. Wood-Mason read a paper on the structure and development of the trachea in the Indian Painted Snipe (*Rhynchæa bengalensis*).

This Meeting closes the present Session. There will be no more Scientific Meetings until the commencement of the next Session in November next.

NOTICES OF NEW BOOKS.

To the Arctic Regions and Back in Six Weeks: being a Summer Tour to Lapland and Norway; with Notes on Sport and Natural History. By Capt. A. W. M. Clark Kennedy, F.R.G.S., &c. With Map and numerous Illustrations. 8vo, pp. 422. London: Sampson Low & Co. 1878.

As a review is of no value unless it conveys the candid and impartial opinion of the critic, we may state at once that we are a little disappointed in this volume. The title, albeit a taking one, scarcely expresses the author's meaning; for, strictly speaking, he was not in the Arctic *Regions* at all, but merely travelled, by a well-known route, to a spot within the Arctic Circle, where the midnight sun may be seen. His tour was the ordinary one, by rail and carriole through the southern part of Norway, and by steamer along the coast to Tromsö. Hence, considering the number of books already published about Norway, it is difficult to comprehend the *raison d'être* of the present volume.

In his Preface, the author says:—

> "My only excuse for adding another volume to the already long and ever-increasing list of Scandinavian travels, is my belief that comparatively few of our fellow-countrymen, and more especially of our countrywomen, who, year after year, 'take their pleasure abroad' by returning each successive summer to the familiar Continent, are aware what a splendid field is open to them by paying a visit to the glorious scenery of Norway, or by pushing still further northward across the Arctic Circle to the wilder land of the Laplanders, and the regions lighted by the rays of the midnight sun."

The whole of this paragraph appears to us to be founded upon a misapprehension, for fewer countries are better known than Norway; and after perusing carefully the 422 pages of Capt. Clark Kennedy's volume we have failed to discover that he has anything new to tell us about it. On the other hand, a good many pages are devoted to matters which have little or no relation to Norway, but appertain strictly to the regions of which he only crossed the threshold. The description, for instance, of the habits of the White Bear (pp. 252—256), and the chase of the Walrus (pp. 257—260), taken from Lamont's well-known volumes, might well have been omitted, seeing that neither of these animals came under the author's personal observation, and the long account given of the Eider Duck (pp. 197—206) contains no statement with which ornithologists are not already familiar through the writings of previous authors.

In some cases Capt. Clark Kennedy's identification of the species of animals mentioned is incorrect; as, for example, at p. 156, where he gives the Beaked Whale, or "Bottle-head," the name *Delphinus tursio* (or, as he erroneously spells it, *tersio*), which appertains to the Bottle-nosed Dolphin, the scientific name of the Bottle-head being *Hyperoodon rostratus* (Chemnitz): nor is it correct to term seals "*Cetaceæ*" (p. 253), nor *Cetacea* "fish" (p. 295).

We must do Capt. Clark Kennedy, however, the justice to say that there are many pages in his work relating to the Natural History of the country visited, which are not only readable but entertaining; and if there is nothing very new in the facts narrated, the author has at least succeeded in imparting an air of novelty by the pleasant manner in which he has dealt with them.

On the subject of birds, especially, Capt. Kennedy has a good deal to say, and moreover, more accurately. Indeed, we should be surprised if this were not the case, for we do not forget his acceptable contribution to the Ornithology of Berks and Bucks, which was favourably noticed in the pages of this journal ten years since, and which brought so much credit to the author, then an "Eton boy" of sixteen.

To give the reader some idea of the author's style, we may quote a few paragraphs from the book before us:—

"The height to which wood grows in Norway is certainly great compared with Scotland, as the following particulars will show. The Scotch fir grows on the mountains of Norway to the great height of 2870 feet above the level of the sea, whilst the common birch exists to the altitude of 3300 feet, and the juniper and many smaller shrubs flourish at even a greater height, where grow also quantities of beautiful flowers and mosses. Oak and beech is very seldom seen in Norway; but the poplar, willows of various kinds, and the beautiful mountain ash are met with almost everywhere, excepting in the extreme north, where the only woods of any extent are of Scotch fir." (P. 86.)

"For the botanist, I can imagine no more charming quarters than Kongsvold at which to stay, while he searches the Dovre-fjeld for specimens of flowers. Some of the rarest wild flowers in Norway are to be found in the neighbouring mountains, and weeks might be pleasantly and profitably spent in examining the plant-life of this wild region. It is stated that one of the first Norwegian botanists, the late Professor Blyth, discovered in his rambles over the Dovre-fjeld no less than 440 plants and ferns, 200 mosses, 150 lichens, and some 50 species of *Algæ*, which list ought to be a sufficient attraction to the botanist to linger here awhile." (P. 122.)

Off the Loffoden Isles on June 26th:—

"Eider-ducks in vast numbers were to be observed on all sides, and flocks of little ducks and gulls just out of the shell were following their parents among the tumbling waves. Skua gulls were there, too, in considerable abundance, and robbers as they are, these birds made a capital thing of it as they pursued the other species of gulls after their successful fishing, and, dashing at them with loud cries, caused them to disgorge whatever they had caught at once, which the Skua picked up before it even reached the water. Large shoals of mackerel were sporting on our starboard-bow; and the fat bodies of their pursuing enemies, the porpoises, were now and then seen rolling over and over in the surf. More than one

Sea Eagle (*Haliætus albicilla*) was soaring far up in the dusky sky, and Golden-eyed Ducks, Great Northern Divers, Terns, Mergansers, Guillemots, Cormorants, Razorbills, and hosts of other species too numerous to name, made the sea and air dark with their ever-moving forms. Such an ornithological treat is not often to be obtained, and we stood on deck for a long time watching, with the greatest interest, the varied forms of life around the ship, which often had to be put at reduced speed in the narrow fjords to give the birds time to hurry their young broods out of danger of being run down. As we progressed northward, the vast flocks of Eider-Ducks seemed ever to increase, and so great were the crowds of the female birds upon some of the numerous islets, that their brown forms perfectly covered the rocks, and they themselves were hardly distinguishable from the tangled masses of dark sea-weed."

A useful portion of Capt. Kennedy's book is the Appendix, containing particulars of his expenditure on his tour, which occupied six weeks. During this time he estimates that he travelled as nearly as possible five thousand English miles. These details will be useful to future travellers who may make the same tour, as will also the route-map which is given at the end of the volume. Some of the illustrations are prettily designed, the Long-tailed Ducks (p. 114), and the "Seals at home" (p. 168) being especially characteristic and natural in outline.

Camp Life and Sport in South Africa. By T. J. Lucas, late Captain Cape Mounted Rifles. 8vo, pp. 258, with coloured Illustrations. London: Chapman and Hall. 1878.

It might reasonably be doubted, on taking up this volume, whether anything remained to be said on the subject of South Africa, after all that has already been published on this fertile theme. It is not very long since Mr. Anthony Trollope presented us with two thick volumes of South African experiences; and his well-known thoroughness might be thought to have exhausted all the ordinary topics of interest in that direction. Captain Lucas's view of the country, however, has been taken from a different stand-point. Unlike Mr. Trollope, whose sojourn there was comparatively short, and who, like many another visitor, wrote merely from first impressions, Captain Lucas's residence of nearly fifteen years has enabled him to form a more mature and probably a more reliable estimate on many points than is likely to be the case with a casual observer. Moreover, the subjects upon which Captain Lucas has most to say are just those upon which a temporary visitor would be likely to know least. Called by the exigencies of his military duties many hundred miles from civilization, he has met with opportunities of enlarging his experience of camp life and the chase of wild animals, which fully justify the appearance of the present volume.

Wisely omitting all description of the outward voyage, with which every one is so familiar, and saying as little as possible on the appearance of Cape Town, which has already been described by numerous writers, he takes the reader at once to his colonial quarters and initiates them into all that he thinks most likely to interest a new-comer, from a military and sporting point of view.

It scarcely falls within our province to criticise the various statistics, however interesting, which are given of the civil and military life, and the account which is furnished of the mode in which Kaffir warfare is conducted. We shall confine attention to such portions of Captain Lucas's narrative as relate more particularly to Natural History.

It is scarcely to be expected that the author could pass Ascension Island without noticing the Turtles and the wonderful colony of Terns which is annually to be found there in the nesting season. So badly is the Island supplied, that the garrison, he tells us, is mainly dependent for its subsistence upon these two sources of provision.

It was not until the author found himself on outpost duty, that he was in a position to observe or make notes on the strange and interesting animal life by which he was surrounded. At Fort Brown, near the banks of the Great Fish River, he employed his leisure hours in learning to preserve and set up birds, of which he found many beautiful species. Conspicuous amongst them were the little Crested Kingfisher, a perfect gem of colour, several species of Sugar-bird *(Nectarinea)*, which were constantly to be seen flying over the Aloe-blossoms, the Orange-throated Lark, the Blue Jay, and the Kaffir Finch, whose black and white plumage and red throat were set off by his long streaming tail, the feathers of which are so prolonged that they droop into a perfect arch, and when flying nearly overbalance him.

The sandy plain on which the Fort was situated was covered with stunted karoo bush, and full of Duyker Gries-buck and Bush-buck. Two kinds of hares frequented the plains; the larger kind grey, furred like our rabbit, and a small red mountain species. On the plains were found enormous land tortoises, and many strange *feræ naturæ*. Not the least singular of these were the Spring-hare, or "Spring-hasen" of the colonists, a singular little animal of the Jerboa species, about the size of an ordinary hare, which burrows in the sand, and only emerges at night to feed, and which when wounded emits a most peculiar scream, like a penny trumpet.

The author's "Cape Pheasant" is, of course, a Francolin. He describes it as much given to running in the thick scrub, whence it is difficult to drive it, and it never rises on the wing unless compelled, when it mounts like a pheasant, and presents an easy mark to the sportsman.

In the category of strange creatures to be found in this district Capt. Lucas includes the Ant-bear, or "Aard-vark," which not only inhabits the frontier, but is spread over all parts of the interior, the surface of the ground for miles being completely honeycombed with the excavations made by the claws of this indefatigable burrower in search of the daily ant-food on which he subsists. His soft muzzle and innocent calf-like head, with its mild bluish eyes, seem almost disproportionate, set upon his bulky shapeless frame, sparsely covered with scanty bristles. His porcine body, again, is at variance with his formidable claws and broad muscular fore-arms, which enable him to dig with ease his circular shaft, some two feet in diameter, in the hardest ground, descending vertically to a depth of three or four feet before it takes its lateral direction. These holes present a formidable obstruction to the hunter, when riding after larger game, and he is frequently rolled over in full career by the sudden subsidence of his horse's fore-legs in one of these dangerous pitfalls. Capt. Lucas had several opportunities of observing the habits of this singular animal. He says:—

> "It leaves its shelter only at night, and is extremely shy and sensitive to discovery, making its earth close to the large ant-heaps, so numerously distributed over the Veldt. Here it scrapes a shallow trench in the upper surface, which has the effect of bringing out the Ants in great numbers; then lying extended at full length, resting on its fore-paws, it launches out its prehensile tongue into the cavity, waiting patiently until it is completely

covered with insects before it withdraws it, which manœuvre it repeats until it is satisfied.* The Ant-bear is sometimes surprised in the open in the day-time by the Boers, who hunt it with dogs, in which case, though unprovided with teeth, it defends itself most effectually by striking out with its strong fore-arms, and tumbles its assailants over right and left, often ripping them up with its dangerous claws. When run to earth, the Boers try to dig it out; but this is no easy matter, for it can make its way underground often more rapidly than they can follow it. They have a way, however, of stopping its progress by stamping, or striking heavily with a pole on the ground over its head, and this confuses it, probably from its uncertainty as to the direction from which danger may be expected. The flesh is considered fit for table, and, according to the Boers, eats like excellent pork, the crackling being esteemed especially delicious. The Hottentots are particularly fond of it."

Speaking of the mode of hunting amongst the Kaffirs, the author states that—

> "When game is scarce they hunt in large parties, and surround a considerable tract of country; the game, consisting of antelopes of various kinds, interspersed with hares and partridges, is driven by the gradually contracting circle towards the centre, where it is eventually despatched with 'knob-kerries' and assegais, the former a long knobbed stick of heavy wood, which they throw with great dexterity, being able to knock down a partridge on the wing at thirty yards."

The Zulus hunt in the same way. Immediately around Pietermaritzberg, game is comparatively scarce, consisting principally of the small Ipite-bok, a graceful little antelope, hyænas, wild pig, and leopards; but as the sportsman advances further towards the Drachenberg, and Umzumkulu, he meets with rhinoceros, hippopotamus, lions, and giraffes.

The author's account of Ostrich-farming at the Cape, a topic which he could scarcely have passed over, is neither so full nor so accurate as might have been expected. When writing this chapter, he was evidently unaware how fully the subject had been dealt with in a work entitled 'Ostriches and Ostrich Farming,' published a year ago by Messrs. Trübner & Co.

A singular account is given (p. 221) of the effect upon antelopes and other wild animals of a shower of "sleety snow," which fell continuously for three days. So fatal did this prove to the animals inhabiting the plains, that the author actually saw Wildebeests and other antelopes making their way blindly into the middle of the town (Bloem Fontaine) in search of shelter, where they were easily captured. "After the storm ceased they were found dying in all directions, and the plains were covered with their carcasses. In the course of an afternoon's ride, he counted as many as seventy dead antelopes of various species, and was informed that Ostriches also were found amongst the slain. A knowing settler turned the circumstance to good account by stripping off the hides as they lay, and sending them in bales to Cape Town for sale."

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* A coloured lithograph is given of the animal, in the characteristic position here described.

Want of space precludes our quoting further from Capt. Lucas's readable book. What he has given us, if not very new, is at all events pleasantly written, and he has wisely avoided the too-common practice of spinning out his material. So agreeably does he detail his experiences that the reader, on reaching the last page, must almost regret that the author has not more to say.

The White Whale. By Henry Lee, F.L.S., F.Z.S., &c. 8vo, pp. 16. London: Burt & Co. 1878.

It was only to be expected that the hundreds who had flocked of late to the Westminster Aquarium, to see the live whale there exhibited, would be glad to be furnished with some account of this remarkable animal; and Mr. Henry Lee's pamphlet, which has just appeared under the above heading, will supply a want which must have been generally experienced. We have heard much disappointment expressed at the size of the Westminster captive, many having expected, it seems, to have found on their arrival at the Aquarium nothing smaller than a Greenland Whale of at least fifty or sixty feet in length. To such persons we may recommend the perusal of Mr. Lee's *brochure*, with the expression of a hope that the extremely interesting history which attaches to the Beluga or White Whale may in some degree compensate for their disappointment.

The "Beluga," *Delphinapterus leucas* (Pallas), or as Mr. Lee terms it *Beluga catodon*, can scarcely be said to belong to the British fauna, only three instances being on record of its appearance on our coasts. Information gathered from trustworthy sources leads to the belief that the annual migrations of the Beluga are so different from—in fact, so contrary to—those of almost all other whales, that further knowledge of its nomadic, but doubtless systematic roamings would be very interesting.

"It is remarkable," says Mr. Lee, "that whilst other roving whales, like the migratory birds, seek a warmer temperature in lower latitudes on the approach of frost, the Beluga, on the contrary, prefers to pass the coldest season amidst the ice and gloom of the Arctic Seas, and the hottest months of the year in comparatively warm water and under sunny skies. It thus exhibits greater capability of enduring a considerable range of temperature than any other whale."

The skin of the Beluga is not invariably creamy white, like that of the specimens brought to England. Capt. Scoresby describes some which he saw as having been of a yellow colour approaching to orange, and others as tinged with a rosy hue. The young are bluish grey, sometimes mottled with brown spots. Like the Common Porpoise, it is far from being a timid animal, when not hunted and persecuted. "Schools" will often accompany a ship and gambol round it for days. The whalers, however, seldom interfere with them. It is difficult to strike them on account of their great activity, and if the skin is pierced it is so tender that the barbs generally draw out. Moreover, when the animal is secured, the blubber is not of sufficient value to pay the crew for their time, labour, and personal risk.

The size to which this species attains has been much exaggerated. Lacépède gives it a length of from twenty to twenty-three feet, but it probably or never exceeds sixteen feet. Mr. Lee states that the longest skeleton he knows of—that in the British Museum—measures only fifteen feet. The condition of the epiphyses of the bones in a skeleton of this whale twelve feet six inches long, in the Museum of the Royal College of Surgeons, shows that ossification was nearly complete, and therefore that the animal had all but reached its full growth.

Mr. Lee has been at some pains to trace the history, so far as known, of this singular animal, and has brought together some curious particulars concerning it. Amongst other things he states that it is erroneous to suppose that the conveyance of live Cetacea for long distances dates merely from the recent exhibition of specimens in this country and in America. Many persons, probably, will be surprised to learn that in olden times it was not only occasionally accomplished, but that dolphins were thus regularly sent to market.

We will not further anticipate Mr. Lee, however, by quoting from his interesting pamphlet, but will recommend our readers to peruse it in its entirety. The account which he gives of the mode of capture, transit and manner of feeding the White Whales which have been brought to this country, will prove as entertaining as it will be new to many.

Rules for Zoological Nomenclature. Drawn up by the late H. E. STRICKLAND, M.A., F.R.S. New Edition, by P. L. SCLATER, Ph.D., F.R.S. 8vo, pp. 27. London: John Murray 1878.

THE Rules originally prepared by Mr. Strickland were first printed in the Report of the British Association for 1842, when a certain number of separate copies were struck off and distributed. In 1863 they were reprinted by Sir William Jardine, under the authority and at the expense of the Association, and they again appeared in the Report of the Association for 1865. But as the separate copies of these various editions have been exhausted, and as there was little chance of obtaining one without purchasing the entire volume of Reports in which they originally appeared, it has been thought desirable by the General Committee of the Association, in view of the great importance of the Rules to zoological science and their general usage by naturalists, to reprint and publish them at the cost of the Association, in such a form as to be, in future, easily accessible.

The superintendence of this new issue has been entrusted to Mr. Sclater, who has "thought it best to adhere closely to the original text of 1842, adding to it the Report of 1865, in which the proposed alterations are given, the text of 1865 never having been properly revised so as to make it accord with the proposed alterations."

We feel assured that the appearance of this new edition of the 'Rules for Zoological Nomenclature' will be welcomed by naturalists, and we cordially recommend it to the notice of our readers.